

PCT COOPERATION TREATY

PCT

NOTIFICATION CONCERNING
SUBMISSION OR TRANSMITTAL
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

PRAGSTEN, Rolf
Telia Research AB
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SUÈDEInkom Kgp
Telia Research AB

1999-04-12

Date of mailing (day/month/year) 23 March 1999 (23.03.99)	
Applicant's or agent's file reference Case 652 PCT	IMPORTANT NOTIFICATION
International application No. PCT/SE99/00121	International filing date (day/month/year) 28 January 1999 (28.01.99)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 29 January 1998 (29.01.98)
Applicant TELIA AB (publ) et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
29 Janu 1998 (29.01.98)	9800249-6	SE	12 Marc 1999 (12.03.99)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

Athina Nickitas-Etienne

Telephone No. (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

PRAGSTEN, Rolf
Telia Research AB
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SUÈDEInkom Kgp
Telia Research AB

1999-08-13

Date of mailing (day/month/year) 05 August 1999 (05.08.99)		IMPORTANT NOTICE	
Applicant's or agent's file reference Case 652 PCT			
International application No. PCT/SE99/00121	International filing date (day/month/year) 28 January 1999 (28.01.99)	Priority date (day/month/year) 29 January 1998 (29.01.98)	
Applicant TELIA AB (publ) et al			

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
EP,JP,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
EE,LT,LV,NO

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 05 August 1999 (05.08.99) under No. WO 99/39498

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35	Authorized officer J. Zahra Telephone No. (41-22) 338.83.38
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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Case 652 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE99/00121	International filing date (day/month/year) 28.01.1999	Priority date (day/month/year) 29.01.1998
International Patent Classification (IPC) or national classification and IPC ₇ H 04 M 11/00		
Applicant Telia AB (publ) et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet. <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of <u>5</u> sheets.
3. This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 25.08.1999	Date of completion of this report 05.05.2000
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Jan Silfverling/CL Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/00121

I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☐ the international application as originally filed.

☒ the description, pages 1-10, as originally filed,
pages _____, filed with the demand,
pages _____, filed with the letter of _____,
pages _____, filed with the letter of _____.

☒ the claims, Nos. _____, as originally filed,
Nos. _____, as amended under Article 19,
Nos. _____, filed with the demand,
Nos. 1-33, filed with the letter of 19.01.2000,
Nos. _____, filed with the letter of _____.

☒ the drawings, sheets/fig 1, as originally filed,
sheets/fig _____, filed with the demand
sheets/fig _____, filed with the letter of _____,
sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/00121

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	<u>1-33</u>	YES
	Claims	_____	NO
Inventive step (IS)	Claims	<u>1-33</u>	YES
	Claims	_____	NO
Industrial applicability (IA)	Claims	<u>1-33</u>	YES
	Claims	_____	NO

2. Citations and explanations

This statement is based on the amended claims filed with the letter of 19 January 2000.

The present invention incorporates test functionality for a line between a CP (Customer's Premises) and a CO (Central Office), or ONU (Optical Network Unit), in a POTS splitter. This enables two-sided measurements on the line, both during installation and during operation. The measurements are performed at the CO end upon request, or when the test device automatically sends a test message/signal. In this way there is no need for field technicians at the CP side. Mentioned test means has a unique identity code, where by said test means is adapted to transmit said unique identity code to the operator whenever a test signal, or message, is transmitted or whenever an identification request signal is received.

In the International Search Report, the following documents were cited:

D1: GB2176970A
D2: US5668857A
D3: WO9720396A2
D4: EP0677938A1
D5: EP0795977A2
D6: US5073919A
D7: EP0338654A2

D1 discloses an automatic remote line testing device at a subscriber's premises enables a telephone line to be tested from the exchange when the subscriber has equipment connected to the other end, even when the equipment is providing a short or open circuit.

.../...

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V

The device comprises a command tone validating circuit, command tone and test signal interface circuits and line transformer and power extractor circuits.

D2 reveals a communication system including a number of subscribers coupled to a central office using twisted pair subscriber lines. The central office includes a telephone switch that provides telephones service to the subscribers, and a communication server having a plurality of xDSL modems that provides data service to the subscribers. The communication server allows over-subscription of data service to subscribers.

D3 presents a data transmission system. This system includes a telephone service subscriber loop utilised for transmission of data including telephone service signals; a splitter operable for splitting the subscriber loop into a first transmission path including a low pass filter which accommodates a continuation of telephone service signal transmissions along the subscriber loop and a second transmission path, said second transmission path including a capacitive element for attenuation of the telephone service signal; and a signal subscriber loop transceiver coupled to the second transmissions path for implementing high rate digital data transmission over the subscriber loop. The transceiver includes a front-end processing circuit having a transmit path and a receive path, whereby at least said receive path comprises a high pass filter for further attenuating said telephone service signals. The capacitive element in the second transmission path and the high pass filter in the receive path of the transceiver front-end operate in conjunction to maintain transhybrid loss.

D4 - D7 show the state of the art in POTS ~~Splitter~~ in the broad band techniques.

The claimed invention now differs from what is disclosed in D1, D2 and D3. To integrate a test means to a splitter is not mentioned in the cited documents and therefore it is not obvious for a person skilled in the art to combine the cited documents and arrive at the invention as claimed.

.../...

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE99/00121

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: V

Therefore, the invention according to claims 1,13 and 16 is novel and is considered to involve an inventive step and have industrial applicability.

The same applies for the dependent claims 2-12, 14-15 and 17-33, as all refer to claims 1, 13 and 16.

CLAIMS

1. An active POTS splitter adapted to separate analogue POTS signals from xDSL signals, characterised in that said active POTS splitter incorporates line testing means adapted to transmit a test signal, or test message, to a line to be tested, said test means is adapted to transmit said signal, or message, automatically, or on receipt of a request signal, mentioned test means has a unique identity code, and in that said test means is adapted to transmit said unique identity code whenever a test signal, or message, is transmitted or whenever an identification request signal is received.

2. An active POTS splitter as claimed in 1, characterised in that said test signal is adapted for the performance of a specific line test.

3. An active POTS splitter, as claimed claim 1, or characterised in that said test signal is of a general form capable of use with a range of different line tests.

4. An active POTS splitter, as claimed in claim 3, characterised in that said test signal comprises at least one pulse.

5. An active POTS splitter, as claimed in claim 3, characterised in that said test signal comprises at least one step.

6. An active POTS splitter, as claimed in claim 3, characterised in that said test signal comprises at least one chirp.

7. An active POTS splitter, as claimed in claim 2, characterised in that said test signal comprises a series of sinusoidal signals of known amplitude, each signal in said series having a different frequency, said series spanning a frequency range for which a line is to be tested.

8. An active POTS splitter, as claimed in claim 7, characterised in that each tone of said series of sinusoidal signals has a duration of a length sufficient

to avoid problems associated with synchronization and to permit a measurement to be completed within said duration.

5 9. An active POTS splitter, as claimed in claim 1, characterised in that said test means is adapted to transmit said test signal, or message, in accordance with a predetermined schedule.

10 10. An active POTS splitter, as claimed in any previous claim, characterised in that said test means is adapted to short-circuit a line.

15 11. An active POTS splitter, as claimed in any previous claim, characterised in that said active POTS splitter, including said test means, is implemented as a single chip.

20 12. An active POTS splitter, as claimed in claim 11, characterised in that said chip is mounted on a PCB connected to a line jack adapted for direct insertion into a customer premises line socket.

25 13. In a telecommunications system adapted to employ xDSL and POTS, and comprising at least one central office connected to a plurality of subscribers by subscriber lines, a method of measuring quality parameters relating to xDSL transmission on a subscriber line, characterised by the steps of:

30 - generating a test signal on said subscriber line at a subscriber's premises alternatively

 -automatically

 -at receiving of a request signal;

35 - a unique identity code is transmitted on mentioned subscriber line;

 - performing measurements at said central station on said test signal as received at said central station; and

- deriving quality parameters for said subscriber line from said measurements.

14. A method, as claimed in claim 13, characterised by generating said test signal by causing said subscriber line to change from a high impedance state to a low impedance state.

15. A method as claimed in claim 13, characterised by generating said test signal by causing a telephone to switch from an "on-hook" state to an "off-hook" state.

16. In a telecommunications system adapted to employ xDSL and POTS, and comprising at least one central office connected to a plurality of subscribers by subscriber lines, each subscriber premises being equipped with a POTS splitter, a method of measuring quality parameters relating to xDSL transmission on a subscriber line, characterised by the steps of:

- said POTS splitter generating a test signal on said subscriber line alternatively

-automatically

-at receiving of a request signal;

- an identity code, unique to the POTS splitter, is transmitted whenever a test signal or message is transmitted, or whenever a request signal regarding identification is received;

- performing measurements at said central station on said test signal as received at said central station; and

- deriving quality parameters for said subscriber line from said measurements.

17. A method, as claimed in claim 16, characterised by said test signal being adapted for the performance of a specific line test.

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18. A method, as claimed in claim 16, characterised by said test signal being of a general form capable of use with a range of different line tests.

5 19. A method, as claimed in claim 18, characterised by said test signal comprising at least one pulse.

20. A method, as claimed in claim 18, characterised by said test signal comprising at least one step.

10 21. A method, as claimed in claim 18, characterised by said test signal comprising at least one chirp.

15 22. A method, as claimed in claim 17, characterised by said test signal comprising a series of sinusoidal signals of known amplitude, each signal in said series having a different frequency, said series spanning a frequency range for which a line is to be tested.

20 23. A method, as claimed in claim 22, characterised by each tone of said series of sinusoidal signals having a duration of a length sufficient to avoid problems associated with synchronisation and to permit a measurement to be completed within said duration.

25 24. A method, as claimed in any of claims 16 to 23, characterised by transmitting said test signal, or message, on receipt of a request signal.

26 25. A method, as claimed in claim 16, characterised by initiating a test at a predetermined time interval after receipt of a request signal.

30 26. A method, as claimed in any of claims 16 to 25, characterised by transmitting said test signal, or message, automatically.

27. A method, as claimed in claim 16, characterised by transmitting said test signal, or message, in accordance with a predetermined schedule.

19 -01- 2000

28. A method, as claimed in any of claims 13 to 26, characterised by each POTS splitter having a unique identity code, and by transmitting said unique identity code whenever a test signal, or message, is transmitted, or whenever an identification request signal is received.
29. A method as claimed in any of claims 13 to 28, characterised by generating said test signal by short-circuiting a line.
30. A method, as claimed in any of claims 13 to 28, characterised by collecting and storing results obtained from line tests at said central office and deriving a log of line condition for each subscriber line therefrom.
31. A method, as claimed in any of claims 13 to 29, characterised by collecting and storing a plurality of results obtained from line tests at said central office and averaging said plurality of results to obtain a composite result for each subscriber line.
32. A telecommunications system adapted to employ POTS and xDSL, comprising at least one central office connected to a plurality of subscriber premises by subscriber lines, at least some of said subscriber premises having a POTS splitter located therein, characterised in that said POTS splitter is a POTS splitter as claimed in any of claims 1 to 12.
33. A telecommunications system adapted to employ POTS and xDSL, comprising at least one central office connected to a plurality of subscriber premises by subscriber lines, at least some of said subscriber premises having a POTS splitter located therein, characterised in that said POTS splitter is adapted to measure subscriber line quality in accordance with the method claimed in any of claims 13 to 28.

B.K



PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year)

22 October 1999 (22.10.99)

International application No.

PCT/SE99/00121

Applicant's or agent's file reference

Case 652 PCT

International filing date (day/month/year)

28 January 1999 (28.01.99)

Priority date (day/month/year)

29 January 1998 (29.01.98)

Applicant

OLOFSSON, Sven-Rune et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

25 August 1999 (25.08.99)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was



was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
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1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

A. Karkachi

Telephone No.: (41-22) 338.83.38

1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/00121

A. CLASSIFICATION OF SUBJECT MATTER		
IPC6: H04M 11/00 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC6: H04M		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
WPIL, EDOC		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5668857 A (JOHN F. MCHALE), 16 Sept 1997 (16.09.97), abstract, see the figures ---	1-37
Y	WO 9720396 A2 (ANALOG DEVICES, INC.), 5 June 1997 (05.06.97), abstract, see the figures ---	1-37
Y	GB 2176970 A (STC PLC, (INCORPORATED IN UNITED KINGDOM)), 7 January 1987 (07.01.87), page 1, line 33 - line 48 ---	1-37
A	EP 0677938 A1 (BELL TELEPHONE MANUFACTURING COMPANY), 18 October 1995 (18.10.95) ---	1-37
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "-" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
12 May 1999		18 -05- 1999
Name and mailing address of the ISA: Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86		Authorized officer Patrik Rydman Telephone No. +46 8 782 25 00

2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/00121

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0795977 A2 (MOTOROLA, INC.), 17 Sept 1997 (17.09.97) ---	1-37
A	US 5073919 A (THOMAS E. HAGENSICK), 17 December 1991 (17.12.91) --	1-37
A	EP 0338654 A2 (CONTROL DATA CORPORATION), 19 April 1988 (19.04.88) -- -----	1-37

INTERNATIONAL SEARCH REPORT

Information on patent family members

07/04/99

International application No.

PCT/SE 99/00121

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5668857 A	16/09/97	AU 2426997 A	22/10/97
		CA 2250487 A	09/10/97
		EP 0890254 A	13/01/99
		US 5781617 A	14/07/98
		US 5852655 A	22/12/98
		WO 9737458 A	09/10/97
WO 9720396 A2	05/06/97	AU 1079797 A	19/06/97
		EP 0864219 A	16/09/98
		US 5757803 A	26/05/98
GB 2176970 A	07/01/87	AU 5855886 A	24/12/86
EP 0677938 A1	18/10/95	AU 695672 B	20/08/98
		AU 1620795 A	26/10/95
		CA 2147091 A	15/10/95
		NZ 270834 A	29/01/97
		US 5627501 A	06/05/97
EP 0795977 A2	17/09/97	JP 9275387 A	21/10/97
		US 5781728 A	14/07/98
US 5073919 A	17/12/91	BE 1005486 A	10/08/93
		CA 2051087 A	11/04/92
		DE 4133309 A	16/04/92
		FR 2668005 A,B	17/04/92
		GB 2250399 A,B	03/06/92
		JP 4227158 A	17/08/92
		NL 9101614 A	06/05/92
EP 0338654 A2	19/04/88	AU 2857189 A	26/10/89
		CA 1309526 A	27/10/92
		JP 1278163 A	08/11/89
		US 4958371 A	18/09/90

APPENDIX INCLUDING THE CLAIMS ON APPEAL
FOR U.S. PATENT APPLICATION SERIAL NO. 09/582,637

34. An active POTS splitter comprising:
active splitter circuitry to be connected to a
subscriber line for separating analog POTS signals from xDSL
signals; and

line test circuitry associated with said active
splitter circuitry for transmitting a test signal on the line
based upon at least one of an event and receipt of a test
request signal, said line test circuitry having associated
therewith a unique identity code transmitted with the test
signal.

35. An active POTS splitter according to Claim 34
wherein the test signal is for a specific line test.

36. An active POTS splitter according to Claim 34
wherein the test signal is in a general form for use with a
range of different line tests.

37. An active POTS splitter according to Claim 34
wherein the test signal comprises at least one pulse.

38. An active POTS splitter according to Claim 34
wherein the test signal comprises at least one step.

39. An active POTS splitter according to Claim 34
wherein the test signal comprises at least one chirp.

40. An active POTS splitter according to Claim 34 wherein the test signal comprises a series of sinusoidal signals of predetermined amplitude, each sinusoidal signal having a different frequency and the series thereof spanning a frequency range for which the line is to be tested.

41. An active POTS splitter according to Claim 40 wherein each sinusoidal signal has a predetermined duration to facilitate synchronization and measurement.

42. An active POTS splitter according to Claim 34 wherein the event is according to a predetermined schedule.

43. An active POTS splitter according to Claim 34 wherein the line test signal comprises a short-circuiting of the subscriber line.

44. An active POTS splitter according to Claim 34 wherein said splitter circuitry and said line test circuitry are implemented as a single integrated circuit.

45. An active POTS splitter according to Claim 44 further comprising:

a printed circuit board mounting said single integrated circuit; and

a line jack connected to said printed circuit board for insertion into a customer premises line socket.

46. In a telecommunications system using xDSL and POTS and comprising at least one central office connected to a plurality of subscribers by subscriber lines extending to each subscriber's premises, a method of measuring quality parameters relating to xDSL transmission on a subscriber line and comprising:

using an active POTS splitter including line test circuitry for generating a test signal on the subscriber line from a subscriber's premises based upon at least one of an event and receipt of a test request signal, and transmitting a unique identity code with the test signal;

performing measurements at the at least one central office on the test signal; and

deriving quality parameters for the subscriber line from the measurements.

47. A method according to Claim 46 wherein the event comprises the subscriber line changing from a high impedance state to a low impedance state.

48. A method as claimed in Claim 46 wherein the event comprises a telephone switching from an on-hook state to an off-hook state.

49. In a telecommunications system using xDSL and POTS and comprising at least one central office connected to a plurality of subscribers by subscriber lines extending to each subscriber's premises, a method of measuring quality parameters

relating to xDSL transmission on a subscriber line and comprising:

using an active POTS splitter including line test circuitry for generating a test signal on the subscriber line from a subscriber's premises based upon receipt of a test request signal, and for transmitting a unique identity code based upon at least one of receipt of a test request signal and receipt of an identification request signal;

performing measurements at the at least one central office on the test signal; and

deriving quality parameters for the subscriber line from the measurements.

50. A method according to Claim 49 wherein the test signal is for performance of a specific line test.

51. A method according to Claim 49 wherein the test signal is of a general form for use with a range of different line tests.

52. A method according to Claim 49 wherein the test signal comprises at least one pulse.

53. A method according to Claim 49 wherein the test signal comprises at least one step.

54. A method according to Claim 49 wherein the test signal comprises at least one chirp.

55. A method according to Claim 49 wherein the test signal comprises a series of sinusoidal signals of predetermined amplitude, each sinusoidal signal having a different frequency and the series thereof spanning a frequency range for which the line is to be tested.

56. A method according to Claim 55 wherein each sinusoidal signal has a predetermined duration to facilitate synchronization and measurement.

57. A method according to Claim 49 wherein the test signal is transmitted a predetermined time after receiving the test request signal.

58. A method according to Claim 46 wherein the event comprises a predetermined schedule.

59. A method according to Claim 49 further comprising transmitting the unique identity code based upon receiving an identification request signal.

60. A method according to Claim 49 wherein the event comprises short-circuiting of the subscriber line.

61. A method according to Claim 49 further comprising collecting and storing results obtained from line tests at the at least one central office and deriving a log of line conditions for each subscriber line therefrom.

62. A method according to Claim 49 further comprising collecting and storing a plurality of results obtained from line tests at the at least one central office and averaging the plurality of results to obtain a composite result for each subscriber line.

63. A telecommunications system adapted to employ POTS and xDSL, comprising at least one central office connected to a plurality of subscriber premises by subscriber lines extending to respective subscriber premises, at least one of the subscriber premises having an active POTS splitter locating therein, the active POTS splitter comprising:

active splitter circuitry to be connected to a subscriber line for separating analog POTS signals from xDSL signals; and

line test circuitry associated with said active splitter circuitry for transmitting a test signal on the line based upon at least one of an event and receipt of a test request signal, said line test circuitry having associated therewith a unique identity code transmitted with the test signal.

In re Patent Application of:

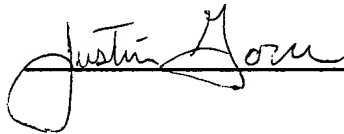
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